AMENDMENTS TO THE SPECIFICATION:

Please amend the specification as follows:

Page 1, replace the paragraph beginning on line 13 with the following amended paragraph:

As for a crystal resonator of an AT cut often used for a crystal oscillator, it is known that a temperature change against a fixed natural resonance frequency is represented by an approximate cubic function as shown in Figure 17. And this temperature characteristic can be approximated as formula (1) below.

$$Y=\alpha(t-t_0)^3+\beta(t-t_0)+\gamma \quad \ldots\ldots\ldots\ldots (1)$$

Here, Y is an output frequency, α is a cubic coefficient, β is a inclination of a temperature characteristic, γ is a frequency ~~offset~~ <u>at t0</u>, and t_0 is a central temperature of a curve, that is, an inflection point (normally, a range from 25 to 30°C). Each of α, β and γ of the above formula (1) greatly depends on the crystal resonator.

Page 6, replace the paragraph beginning at line 1 through page 7, line 16 with the following amended paragraph:

A k-th order component generating circuit according to claim 1 of the present invention is characterized by comprising: a plurality i (i is an integer of 5 or more) of differential amplifiers for having a common linear input signal inputted to one input terminal, having a constant level signal of a predetermined level inputted to the other input terminal, outputting an reversed or non-reversed signal to the linear input signal and having a limiter function of limiting an output signal to predetermined maximum and minimum values; and a constant level signal generating circuit for providing the constant level signal to each of the i differential amplifiers, wherein: first, second and third

differential amplifiers of the i differential amplifiers are set to have the constant level signals at increasingly higher levels inputted in order; the output signals of the first and third differential amplifiers and those of the second differential amplifier are set to be of mutually reverse polarity; a fourth differential amplifier of the i differential amplifiers has the constant level signal to be inputted set as the signal at the same level as the constant level signal to be inputted to the second differential amplifier, and has the output signal thereof set to be of the same polarity as the output signals of the first and third differential amplifiers and also has a range of the input signal to be the maximum value and the input signal to be the minimum value set larger than that of the second differential amplifier; each of (i - 4) differential amplifiers other than the first, second, third and fourth differential amplifiers of the i differential amplifiers has the constant level signal to be inputted set to be either lower than a level of the constant level signal to be inputted to the first differential amplifier or higher than a level of the constant level signal to be inputted to the third differential amplifier, and the output signals of the (i - 4) differential amplifiers and those of the second differential amplifier are set to be of mutually reverse polarity, thus constituted to form the output signal of the component of a k-th order function (k is an odd number of 3 or more) on adding up the output signals of the first, second, third and (i - 4) differential amplifiers; and the fourth differential amplifier is constituted to form the output signal of a linear component for offsetting the linear component of the **[[n-th]]** k-th order function component so as to generate the component of the k-th order function including no linear component by adding the output signals of the i differential amplifiers.

Page 9, replace the paragraph beginning on line 1 with the following amended paragraph:

The [[third]] k-th order component generating circuit according to claim 5 of the present invention is characterized by being set as i = 6 and k = 5 in claim 1.

Page 23, replace the paragraphs beginning on line 23 through page 25, line 24 with the following amended paragraphe:

An n-th order function may be generally represented as in formula (5) below.

$$f(x) = a_n x^n + a_{n-1} x^{n-1} + \ldots\ldots + a_3 x^3 + a_2 x^2 + a_1 x + a_0$$

$$= a_n'(x-x_0)^n + a_{n-1}'(x-x_0)^{n-1} + \ldots\ldots$$

$$+ a_3'(x-x_0)^3 + a_1'(x-x_0) + a_0' \quad \ldots\ldots (5)$$

As a concrete example, a fifth order function may be represented as in formula (6) below.

$$f(x) = a_5 x^5 + a_4 x^4 + a_3 x^3 + a_2 x^2 + a_1 x + a_0$$

$$= a_5'(x-x_0)^5 + a_4'(x-x_0)^4 + a_3'(x-x_0)^3$$

$$\cancel{+ a_1 (x-x_0) + a_0' \ldots\ldots\ldots\ldots (6)}$$

$$\underline{+ a_1' (x-x_0) + a_0' \ldots\ldots\ldots\ldots (6)}$$

In this formula (6), relations among coefficients are as follows.

$a_5' = a_5$

$a_4' = a_4 + 5\ a_5\ x_0$

$a_3' = a_3 + 4\ a_4\ x_0 + 10\ a_5\ x_0^2$

$a_1' = a_1 - 3\ a_3\ x_0 - 8\ a_4\ x_0^3 - 15\ a_5\ x_0^4$

$a_0' = a_0 + a_1\ x_0 - 2\ a_3\ x_0^3 - 5\ a_4\ x_0^4 - 9\ a_5\ x_0^5$

However, x_0 is a solution to the following cubic equation.

$10\ a_5\ x_0^3 + 6\ a_4\ x_0^2 + 3\ a_3\ x_0 + a_2 = 0$

As for this x_0, one solution or three solutions can be obtained so that a value close to an assumed value should be selected. x_0 in the formula (6) becomes "29" due to this

conversion, which is approximately equal to an inflection point on approximating the same data to a cubic function near a center of a normally compensated temperature range. Therefore, it becomes advantageous as a circuit configuration in that a cubic component is a main component while fourth and fifth order components become smaller.

And a fourth order function may be represented as in formula (7) below.

$$f(x) = a_4 x^4 + a_3 x^3 + a_2 x^2 + a_1 x + a_0$$

$$= a_4'(x-x_0)^4 + a_3'(x-x_0)^3$$

$$\cancel{+a_1 (x-x_0)+a_0' \ldots\ldots\ldots\ldots (7)}$$

$$\underline{+a_1'(x-x_0)+a_0' \ldots\ldots\ldots\ldots (7)}$$

In this formula (7), the relations among the coefficients are as follows.

$a_4' = a_4$

$a_3' = a_3 + 4\, a_4\, x_0$

$a_1' = a_1 - 3\, a_3\, x_0^2 - 8\, a_4\, x_0^3$

$a_0' = a_0 + a_1\, x_0 - 2\, a_3\, x_0^3 - 5\, a_4\, x_0^4$

However, x_0 is a solution to the following quadratic equation.

$6\, a_4\, x_0^2 + 3\, a_3\, x_0 + a_2 = 0$

As for this x_0, two solutions can be obtained so that a value closer to the center of a curve should be selected. Consequently, x_0 is "31" which is approximately equal to the inflection point on approximating the same data to the cubic function near the center of the normally compensated temperature range. Furthermore, the orders when represented in formula (7) as described above can be illustrated as in Figure 21 so that the fourth order component is within ±3 ppm. Thus, if represented in a formula having no second order component such as the formula (6) or (7), the main components are

the cubic components and linear components and only a few high order components having the inflection points approximately equal to the inflection points of the cubic components are added. It is a very advantageous configuration as a dynamic range of a circuit for generating control voltage equivalent to this.

Page 29, replace the paragraph beginning on line 23 with the following amended paragraph:

The differential amplifiers 15C, 15D, 15E and 15F also have the same configuration as the differential amplifier 15A, and have the constant level reference voltages V_{REFL1}, V_{REFH1}, V_{REFL2} and V_{REFH2} generated by the constant level signal generating circuit 20 inputted respectively. And the MOS field-effect transistors TrA_1, TrB_2, TrC_1, TrD_1, TrE_1 and TrF_1 are connected to the resistance 16A constituting the adder via the MOS field-effect transistor 17 with their connection points connected to an inverting input side of the ~~operational~~ <u>differential</u> amplifier 12.

Page 33, replace the paragraph beginning on line 13 with the following amended paragraph:

If the ~~output~~ <u>input</u> voltage V_{IN} further increases after becoming $I_{POUT} = 2\ I_0$ and $I_{NOUT} = I_0$, the current starts passing through the MOS field-effect transistor TrD_1 of the differential amplifier 15D and the current passing through the MOS field-effect transistor TrD_2 starts decreasing. If the input voltage V_{IN} reaches the constant level reference voltage V_{REFH1}, the output currents I_{POUT} and I_{NOUT} become $I_{POUT} = I_{NOUT} = 3\ I_0/2$ again. And if the input voltage V_{IN} further increases, they become $I_{POUT} = I_0$ and $I_{NOUT} = 2\ I_0$.